

S/N unknown

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: HIRAO et al. Serial No.: unknown
Filed: concurrent herewith Docket No.: 10873.632US01
Title: BLOOD TESTING TOOL

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By:



Name: Brant Miles

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D. C. 20231

Dear Sir:

In connection with the above-identified application filed herewith, please enter the following preliminary amendment:

IN THE CLAIMS

Please amend the claims as follows:

3. (amended) The blood testing tool according to claim 1, wherein pores in the development portion include only pores through which blood cells cannot pass.

22. (amended) The blood testing tool according to claim 14, wherein a part of the holder corresponding to the development portion is transparent.

23. (amended) The blood testing tool according to claim 14, wherein a slit is formed at a part of the holder corresponding to the development portion.

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REMARKS

The above preliminary amendment is made to remove multiple dependencies from claims 3 and 22-23. A marked-up copy of the original claims is enclosed.


Applicants respectfully request that the preliminary amendment described herein be entered into the record prior to calculation of the filing fee and prior to examination and consideration of the above-identified application.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicants' primary attorney-of record, Douglas P. Mueller (Reg. No. 30,300), at (612) 371.5237.

Respectfully submitted,

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Dated: December 26, 2000

By 
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WHAT IS CLAIMED IS:

1. A blood testing tool, comprising an asymmetric porous membrane with a pore size distribution in which an average pore size varies so that it is reduced continuously or discontinuously in a thickness direction,

wherein the asymmetric porous membrane includes a blood supply portion, a development portion, and a blood-cell blocking portion formed between the blood supply portion and the development portion, pores in the blood-cell blocking portion include only pores through which blood cells cannot pass, the arrangement being such that when blood is supplied to the blood supply portion at a side having larger pores, the blood moves in a direction substantially parallel to a surface of the asymmetric porous membrane by capillary action, but only blood plasma or blood serum moves into the development portion.

2. The blood testing tool according to claim 1, further comprising a groove formed between the blood supply portion and the development portion, wherein a portion between a bottom of the groove and a part of a surface of the asymmetric porous membrane corresponding to the bottom is the blood-cell blocking portion.

* 3. The blood testing tool according to claim 1 ~~or 2~~, wherein pores in the development portion include only pores through which blood cells cannot pass.

4. The blood testing tool according to claim 1, wherein the pores in the blood-cell blocking portion have a pore size in a range of 1 to 50 μm .

5. The blood testing tool according to claim 1, wherein in the asymmetric porous membrane, the maximum pore size is in a range of 30 to 300 μm and the minimum pore size is in a range of 1 to 30 μm .

6. The blood testing tool according to claim 1, wherein the asymmetric porous membrane has a single layer structure.

7. The blood testing tool according to claim 1, wherein the asymmetric porous membrane is supported by a supporter.

8. The blood testing tool according to claim 1, wherein the asymmetric porous membrane is formed from at least one resin selected from a group consisting of polysulfone, polyamide, polyimide, polycarbonate, polystyrene, and polyaryl hydrazide.

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9. The blood testing tool according to claim 1, wherein the asymmetric porous membrane is treated to be provided with hydrophilicity.

10. The blood testing tool according to claim 1, wherein the development portion comprises a stabilizing agent for maintaining stability of components in the blood plasma or the blood serum.

11. The blood testing tool according to claim 1, wherein the development portion comprises an analytical reagent.

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12. The blood testing tool according to claim 2, wherein the groove is formed by compression of a part of the asymmetric porous membrane.

13. The blood testing tool according to claim 2, wherein the groove is formed by cutting out of a part of the asymmetric porous membrane.

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14. The blood testing tool according to claim 1, further comprising a holder,

wherein the holder contains the asymmetric porous membrane, and a space with a size preventing a capillary phenomenon from occurring is formed between an inner wall of the holder and a portion between the development portion and the blood supply portion.

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15. The blood testing tool according to claim 14, further comprising a protruding supporter formed inside the holder, wherein the protruding supporter lifts the portion between the development portion and the blood supply portion, thus forming the space.

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16. The blood testing tool according to claim 15, further comprising a protruding holding portion formed inside the holder on an opposite side to the side on which the protruding supporter is formed, wherein the holding portion fixes the development portion to the inner wall of the holder on the

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side on which the protruding supporter is formed.

17. The blood testing tool according to claim 14, wherein the portion
between the blood supply portion and the development portion is the blood-
cell blocking portion.

18. The blood testing tool according to claim 14, wherein the space has a
height in a range of 0.05 to 3 mm.

19. The blood testing tool according to claim 1, further comprising a
holder,
wherein the holder contains the asymmetric porous membrane and
has a blood guide hole at a position corresponding to the blood supply portion,
a predetermined space is provided between a lower end of the blood guide
hole and the blood supply portion, and blood is retained in the space
quantitatively by surface tension of the blood.

20. The blood testing tool according to claim 19, wherein the holder has
a hole and an annular protrusion is formed on an inner wall of the holder so
as to surround the hole, so that the blood guide hole is formed by the hole
and a space inside the annular protrusion, and an end of the annular
protrusion is the lower end of the blood guide hole.

21. The blood testing tool according to claim 19, wherein the space has a
height in a range of 10 to 3,000 μm .

* 22. The blood testing tool according to claim 14[or 19], wherein a part of
the holder corresponding to the development portion is transparent.

* 23. The blood testing tool according to claim 14[or 19], wherein a slit is
formed at a part of the holder corresponding to the development portion.

24. The blood testing tool according to claim 19, wherein a space with a
size preventing a capillary phenomenon from occurring is formed between an
inner wall of the holder and a portion between the development portion and
the blood supply portion.